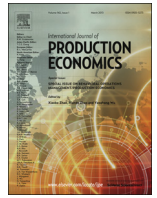




Contents lists available at ScienceDirect

Int. J. Production Economics

journal homepage: www.elsevier.com/locate/ijpe

Wealth and health at the Base of the Pyramid: Modelling trade-offs and complementarities for fast moving dairy product case

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ARTICLE INFO

Article history:

Received 15 April 2014

Accepted 1 August 2015

Keywords:

Base of the Pyramid

Pricing strategies

Poverty alleviation

Health improvement

System dynamics

Modelling

ABSTRACT

This paper models the localized Base of the Pyramid (BoP) supply and demand chain of a fast moving dairy product within its (social and business) environment for identifying the effects of various pricing strategies on wealth and health of the poor population of Bangladesh. The joint venture of the Grameen Bank and Danone (GD) in Bangladesh is a showcase of integrative BoP projects. It produces fortified yoghurt in a micro-plant and distributes it through micro-entrepreneurs, following a strictly localized approach. The objective of this BoP project is twofold; (1) integrating as many people as possible into productive processes and paying decent prices, wages, and commissions (wealth) and (2) regularly serving as many people as possible with fortified yoghurt (health).

By means of dynamic simulation, we analyse how volatility in raw material prices affects the economic viability of the business model and hence both objectives. The GD case provides the motivation as well as empirical data for the presented research and has been used for model validation. Additionally, we use further literature sources.

Our results show the outstanding importance of sales effectiveness for buffering against negative consumer reaction to sudden price increases. Sales effectiveness aggregates various performance factors regarding product distribution and perceived product quality and value. In this respect, awareness raising campaigns by governmental and civil society organizations as well as changes regarding distribution mode and selection of distributors may enhance sales effectiveness.

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1. Introduction

In 2008, the young Grameen Danone (GD) joint venture, founded in 2006 and starting business in early 2007, faced an unprecedented crisis threatening its existence. GD runs a social business in rural Bangladesh, near to the city of Bogra, that sources milk locally and sells fortified yoghurt (named “Shokti Doi”) to the poor population in the surroundings of the micro-plant (Yunus et al., 2010; Yunus and Weber, 2010). This social business follows the approach of “integrative BoP” (Hahn, 2009) or “BoP 2.0” (Simanis et al., 2008) that not only aims to serve the “Base of the Pyramid” (BoP) as consumers but also actively pursues the integration of these population groups into value creation. Seminal

papers by Prahalad and Hart (2002) and Prahalad and Hammond (2002) have popularized the concept of the BoP, which refers to the bottom tier of the world income pyramid that represents the large share of people living in extreme and moderate poverty. GD pursues the two objectives of income generation and health improvement at the BoP by (1) integrating as many people as possible into productive processes and paying decent prices, wages, and commissions and (2) regularly serving as many people as possible with fortified yoghurt to improve nutrition. These two strategic objectives were targeted by a labor intensive business model (with local sourcing of milk, a locally-run yoghurt plant, and local distribution network) and low prices, initially 5 Takas for an 80g cup of yoghurt (which equaled 0.07 US-\$ in 2007).

The crisis was triggered by a world-wide increase of food prices starting in 2007 (for the following see especially Yunus et al., 2010; Yunus and Weber, 2010). In 2008, the price of milk as principal raw material of yoghurt doubled in Bangladesh, making GD substantially lose money with each cup sold in early 2008. The

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administrative council of GD debated on how to respond to this new situation. Overall, two opinions were prevalent; one group preferred to increase the price in order to cover the additional costs incurred; another group intended to continue the current pricing since they feared that a considerable price increase in the phase of market launch could jeopardize the whole project. The first group, insisting on the indispensability of economic viability of the social business, finally prevailed and hence in April 2008 the price was increased to 8 Takas. As a result, the volume sold fell about 80% in rural areas and about 40% in the city of Bogra. The sharply decreasing sales figures resulted in a breakdown of the established distribution network formed by a local female workforce called the “Grameen Ladies”, which further complicated the situation for GD. The threatened survival of the young joint venture made GD radically rethink their product volume and pricing strategy. It was found that the same portion of micronutrients (iron, zinc, and vitamins)—representing 30% of the daily intake recommended to a child—could also be injected in a cup of only 60g yoghurt. The decision of offering 60g of yoghurt for 6 Takas in June 2008 started the process of recovery of Shokti Doi in rural Bangladesh.

This episode shows the strong price sensitivity of people at the BoP (particularly in times of worldwide food price inflation) and the constraints of a social business with its ground-laying principal of economic viability. Detached from this unique historical situation, one may even more generally assume a trade-off (at least in a short-term) between the objective of generating income at the BoP (by creating jobs and employment and by paying decent raw material prices, wages, and commissions) and the objective of distributing the fortified food product as widely as possible to the BoP and hence improving the provision of these population groups with micronutrients. The appropriate pricing strategy is also contingent on the consumer market potential, consumer satisfaction with product quality, as well as the efficiencies and limits of sourcing and distribution operations (available workforce and distribution radius dependent on infrastructure and transport mode).

Based on these considerations and concentrating on the initial GD idea of solely localized production and distribution, we ask the following research question: What pricing strategy is most appropriate for reconciling the objectives of wealth generation and health improvement at the BoP for the case of localized fortified yoghurt production and distribution in Bangladesh? With this, we contribute to shedding light on a very general and pressing issue in the BoP literature: The question of its overall suitability for improving the lives of poor people while remaining economically feasible. Based on a system dynamics simulation fed with data from a rich case study, we take an in-depth look at possible trade-offs and success factors of BoP ventures.

BoP literature so far offers only very few modelling-oriented studies, even if modelling could provide valuable insights to the complex problems BoP business models face. This study contributes to the literature by methodologically invigorating BoP research. At the same time, it extends the few existing modelling approaches in this domain, which are so far rather marketing-oriented and focus on durable BoP goods such as electricity (Kumar et al., 2010), telecommunication (Kumar et al., 2007; Ratcliff and Doshi, 2013) or housing (Ratcliff and Doshi, 2013). Moreover, the system dynamics approach allows us to scrutinize the impact not only on economic aspects (wealth) but also on further social issues of fundamental importance at the BoP (health). A focus on the socio-economic double-bottom line is indeed rather common to recent BoP projects (Gold et al., 2013), but still rarely considered in sustainability related modelling in a non-BoP context (e.g., Brandenburg et al., 2014). In this way, our study contributes filling the dearth of modelling research at the

socio-economic interface, which receives growing interest from business practitioners and policy-makers also in industrialized economies.

The paper is structured as follows. First, a literature review describes the state-of-the-art of management research on BoP business models and highlights the dearth of respective supply chain and operations management research. Next, the methodology of system dynamics modelling is outlined. After explaining the model of localized yoghurt production, distribution, and consumption in rural Bangladesh (based on empirical data derived from the case of Shokti Doi yoghurt), results are presented. We identify most suitable pricing strategies for reconciling wealth and health objectives. Thereby, we detect the strong importance of sales effectiveness for keeping customers loyal even in the context of rising prices. We further discuss the implications of these findings against the background of relevant academic literature and for deriving practical recommendations for BoP projects. The paper concludes by outlining limitations of the system dynamics modelling approach based on empirical data and by pointing towards directions for future research.

2. Literature review

Prahalad and Hart (2002) as well as Prahalad and Hammond (2002) published the first seminal papers on business at the BoP which aroused strong attention among scholars from management but also adjacent disciplines such as development studies. Since then, research on business for and with the poor of the world has increasingly solidified as shows the recent comprehensive literature review by Kolk et al. (2014). Our present overview of the literature will thus only briefly outline the development of BoP research, from “BoP 1.0” to “BoP 2.0” and “integrative BoP”, respectively. This evolution has been driven by empirical insights into the specific conditions and requirements of business models at the BoP as well as by fierce academic criticism pinpointing the shortcomings of early marketing-focused approaches. Furthermore, we point to a dearth of research modelling production and distribution at the BoP. Thus, we identify a lack of research linking abstract strategic considerations with hands-on practical implications by considering the constraints of real business cases.

Early examples of BoP research during the phase of so-called “BoP 1.0” often focused distinctly on poor people as a vast consumer group to be tapped by companies (e.g., Guesalaga and Marshall, 2008; Prahalad, 2005; Subrahmanyam and Gomez-Arias, 2008). This early phase was hence marked by discussions on the specificities of marketing products to the BoP (e.g., Garrette and Karnani, 2010; Ireland, 2008; Rajagopal, 2009; Wood et al., 2008). Aspects of product adaptation (e.g., Nakata and Weidner, 2012; Ratcliff and Doshi, 2013; Whitney and Kelkar, 2004) to be made for better fitting the products to the needs of the targeted BoP population were usually considered only marginally. However, research increasingly acknowledges the key role that cultural and societal specificities play when selling to the BoP. Products designed for industrialized countries may need to be modified for being culturally acceptable and finally accepted. In this regard, poor Indian women for example, prefer soap to shampoo for washing their hair, and Chinese poor rural population tend to use their washing machines for multiple purposes such as for cleaning vegetables, as reported by Anderson and Markides (2007).

The early stream of consumer-centred BoP 1.0 research evoked fierce criticism (e.g., by Karnani, 2005, 2007, 2008 and Arora and Romijn, 2012) regarding the actual negative effects of the respective business models for the BoP and the neglecting of a stringent advocacy in favor of the poor. Tapping the emerging markets at the

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